We claim:

1. A method of detecting a bioactive compound, comprising:

exposing fish chromatophores to the bioactive compound; and

detecting a change in at least one chromatophore in response to the bioactive compound.

2. The method of claim 1, further comprising detecting an optical change in at least one chromatophore.

3. The method of claim 1, wherein the changes in the at least one fish chromatophore is selected from a group consisting of pigment aggregation, pigment dispersion, and hue changes.

4. The method of claim 1, wherein the bioactive compound is selected from a group consisting of neurotransmitters, adrenergic agonists, adrenergic antagonists, seratonergic antagonists, hormones, cytoskeletal inhibitors, cAMP Signal transduction modulators, calcium ion signal transduction modulators, membrane voltage regulators, neurotoxins, protein kinase modulators, caustic irritants, heavy metals, polyaromatic hydrocarbons, organo phosphate nerve agents, psychogenic agents, antihistamines, enzyme inhibitors, algal toxins, bacteria, and bacterial protein toxins.

5. The method of claim 1, wherein the bioactive compound includes a bacteria, fungus, virus, plant, or animal.

6. The method claim 1, wherein the fish chromatophores are Betta chromatophores.

7. A method of identifying classes of bioactive compounds, comprising:

exposing a first type of chromatophore to a sample;

exposing a second type of chromatophore to a sample; and

identifying at least one class of compounds based on detected responses of the first and second types of chromatophores.

8. The method of claim 7, wherein the first and second types of chromatophore are melanophores and erythrophores, respectively.

9. The method of claim 8, wherein the chromatophores are fish chromatophores.

10. A method of identifying a calcium channel blocker, comprising:

exposing an erythrophore to a sample and producing an erythrophore response;

exposing a melanophore to the sample and producing a melanophore response; and

determining if the sample includes a calcium channel blocker based on the erythrophore response and the melanophore response.

11. A method of detecting bioactivity of a test compound, comprising:

placing one or more color classes of chromatophores in functional contact with the test compound; and

measuring a color response of at least one of the classes.

12. The method of claim 11, further comprising encapsulating the chromatophores and the test compound so that the chromatophores are exposed to the test compound after encapsulation.

13. The method of claim 12, further comprising determining if the test sample includes a compound selected from a group consisting of neurotransmitters, hormones, intracellular signal transduction agents, pharmaceutically active agents, toxic agents, agricultural chemicals, chemical toxins, biological toxins, microbes, and animal cells based on the color response.

14. The method of claim 12, further comprising selecting a functional target of at least one chromatophore.

15. The method of claim 14, wherein the functional target is selected from the group consisting of macromolecules, enzymes, receptors, membranes, cytoskeletal structures, cellular organelles, second messenger signals, and cytoplasmic elements.

16. A test kit for the detection of bioactive compounds comprising:

a nutrient solution containing at least one color class of chromatophore; and

a positive control solution.

17. The test kit of claim 16 wherein the positive control solution contains a compound selected from the group consisting of: norepinephrine, serotonin, forskolin, caffeine, adensosine, dopamine, melanocyte stimulating hormone, melanophore concentrating hormone, and structural and pharmacological analogs, agonists and antagonists of such compounds.

18. The test kit of claim16, wherein the chromatophore is selected from the group consisting of: *Betta splendens, B. schaumnestbauer, B. bellica, B. coccina, B. farciata; B. foerrchi; B. imbellir, B. rmaragdina, B. splendens, Betta maulbruter, B. anabatoidcr, B. balunga, B. brederi, B. macractoma, B. picta, B. pugrrax, B. rubra, B. taeniata, and B. unimaculata.*

19. A cytosensor, comprising:

a reaction chamber configured to receive at least one chromatophore and at least one analyte sample; and

a detection system configured to detect a chromatophore response to the analyte sample.

20. The cytosensor of claim 19, wherein the chromatophore is a Betta chromatophore.

21. The cytosensor of claim 19, further comprising a plating surface configured to retain the chromatophore.

22. The cytosensor of claim 19, wherein the detection system is configured to detect a change in an optical property of the chromatophore.

23. The cytosensor of claim 22, further comprising a signal processing system in communication with the detection system and configured determine a hue, saturation, or value coordinate.

24. A fluid valve, comprising:

a capture plate;

an orifice;

a capture dot situated between the capture plate and the orifice, and configured to allow a fluid flow through the capture plate and to selectively block a fluid flow from the capture plate into the orifice; and

a magnetic field generator configured to retain the capture dot to selectively permit fluid flow from the capture plate into the orifice.

25. A method of testing a bioactive compound, comprising:

selecting a test cell that produces a cell-induced response on a chromatophore;

exposing a combination of at least one chromatophore and the test cell to the bioactive compound;

exposing the combination to a control compound selected based on a control response produced on the chromatophore;

determining a measured response of the chromatophore to the exposure of the combination to the control compound; and

evaluating the bioactive compound based on a difference in the measured response, the cell-induced response, and the control response. .

26. The method of claim 25, wherein the test cell is a bacteria associated with a cell-induced response that inhibits a chromatophore response.

27. The method of claim 26, wherein the control compound is norepinephrine.